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SECTION 1 - PURPOSE OF AND NEED FOR ACTION

Purpose

Watershed analysis for the East Fork Coquille River Watershed has been conducted (BLM, CBDO, May 2000). Steel Creek is listed under 'Aquatic Habitat' areas with "excellent opportunities and good access for instream placement of large woody debris (LWD)"; "such projects would address LWD and/or pool complexity deficiencies . . . " The intent of the proposed action is to retain gravel for spawning habitat for coho and steelhead, increase channel roughness to provide diversity of aquatic habitats and create low-velocity juvenile salmonid habitats; additional pool habitats would be created by promoting step-pool formations with LWD additions, which would also enhance pool complexity.

The purpose of the environmental assessment is to:

- assess any potential environmental impacts that may result if the No Action, Proposed Action or an Alternative is implemented,
- identify appropriate mitigation measures,
- document the decision-making process

Additional specialist reports and analysis documents are contained in the analysis file and are hereby incorporated by reference.

Need

The stream reach proposed for restoration is deeply entrenched and its patterns, profiles and dimensions are the product of erosion into weathered bedrock. The main processes at work in this type of channel include routing water, sediment, and LWD from up-slope channels. Much LWD has been removed which has resulted in channel downcutting. This reach has a gradient of approximately 3%, therefore, fine and coarse sediments are readily transported downstream during high flows. The lack of LWD to trap gravels and create quality pools limits areas for fish spawning, rearing and holding (FEMAT 1993). A review of aerial photography from 1950 suggests that this reach of Steel Creek was not incised at that time. However, within the 1959 photos there were indications that downcutting had begun. Apparently around this time, removal of wood had occurred within Steel Creek. The 1959 photos also reveal that harvest activities were taking place adjacent to an upstream reach.

Coho spawn within this reach of Steel Creek, and often the redds become superimposed due to the availability of spawning gravel. This situation is likely resulting in lower spawning success in this reach overall. The upper end of this .3 mile reach is defined by steep cascades which pose a partial migration barrier to coho. This barrier is most likely an artifact of the channel incision that resulted from past management practices. Consequently, those fish migrating to this upper stream reach may be stopped at the steep cascade, and forced to utilize the marginal spawning habitat in the immediate vicinity. Steelhead can be found within this reach but are also able to traverse the falls during normal winter

flows to avail themselves of the habitat upstream.

The 28-11-1.0 road that parallels this reach is informally 'closed' by an earthen berm. There are culverts remaining in this road that pose a risk of clogging, washing out the road, thereby likely delivering sediment to Steel Creek. Also, the East Fork Coquille River Watershed Analysis states that this road has been recommended for decommissioning. This would result in a change in road density within the Steel Creek drainage from 3.5 mi/mi^2 to 3.3 mi/mi^2.

Adjacent to the stream crossing location and in between structure site 1 and 2 is approximately .1 acres of Himalayan blackberry within the riparian area. The presence of this invasive species has resulted in minimal natural regeneration of native riparian species. Removal of blackberry and the planting of big leaf maple, myrtle, western red cedar, and Douglas fir and the seeding of native grasses would return this area to the expected plant association, and would provide future shade and large wood recruitment potential.

The goals of the proposed project are to:

- accumulate gravel for spawning coho and steelhead
- slow water to provide backwater habitat for juvenile salmonids
- add complexity and cover
- enhance pool quality and quantity
- Remove two culverts within the adjacent 28-11-1.0 road, thereby decommissioning .91 miles of road and reducing road density.
- Increase future stream shade and woody debris recruitment by the removal of invasive noxious weeds from approximately .1 acres of stream bank within the Riparian Reserve and replant with conifer, big leaf maple and myrtle seedlings.

Identified Issues and Resolutions

Issue 1: Would the project improve aquatic habitat quality?

Resolution: Structures that would allow the proposed project reach to accumulate gravel would substantially improve habitat quality. Due to the gradient of the reach and the narrow valley in which it resides, substrates would not be retained within the reach without the addition of key structural elements.

Issue 2: Can water quality be maintained during project implementation, specifically, heavy equipment crossing the stream channel? What options for crossing are viable?

Resolution: The hydrologist suggested that a temporary culvert could be placed in Steel Creek. River rock, filter fabric or geotextile, and crushed aggregate would be placed over the culvert and can be removed without substantial turbidity. Boulders could be employed

on either side of the culvert crossing to stabilize the river rock and crushed aggregate. Alternatively, the equipment could be driven directly over the bedrock substrate. During low flow, the main wetted channel is recessed within a fissure in the bedrock substrate. This method would require the grading of both streambanks to make the descent and approach feasible for the rock and log trucks and for the yarder. Bioengineering techniques would be employed according to techniques identified in 'Steambank Revegetation and Protection (ADFG, 1998) to reestablish the banks at the close of the project. Pathways for short-term turbidity/sediment delivery to the stream would result.

Another option is the use of a bridge that spans the creek. The banks would still have to be graded back to make placement of the bridge feasible, but not as much as with the bedrock ford option. There are two berms on the left bank that would need grading regardless of what stream crossing option is chosen; the approach on the right bank would likewise require reshaping/grading regardless of which option is chosen. The invasive vegetation is proposed for removal in the location of the stream crossing, so bioengineering would be required regardless of the method of crossing. Less turbidity is expected with the bridge than in the other two crossing options.

Issue 3: Are there any Marbled Murrelet occupied sites or potential habitats nearby**?** What is the nearest occupied Spotted Owl site?

Resolution: ID Team member/wildlife biologist indicates that the proposed project lies entirely within an occupied marbled murrelet site. Timing and operating restrictions apply. There are no known spotted owl site centers within 0.25 miles of the project area.

Issue 4: What steps should be taken in the decommissioning of the road?

Resolution: There are two culverts that should be removed within the first 1,300 feet of the road. One culvert is on a perennial tributary to Steel Creek; during the removal of this culvert, the water will be rerouted around the activity and into its channel downstream. The area remaining after the culvert is removed will be returned to pre-road hydrologic function. The other is a ditch relief culvert that is plugged and tends to back water. The remaining culvert is approximately 1,200 feet beyond the first two and appears to be ephemeral (no substrate existing, channel vegetated). The soil scientist believes that instead of moving the excavator up the road another 1,200 feet over ground that is nearly overgrown by fern, a small trough/ditch could be easily hand-dug above the existing culvert to direct flow. If the culvert becomes plugged, any water would be directed back into the channel and would not be diverted down the road.

Issue 5: What are the Port-Orford-cedar (*Chamaecyparis lawsoniana*) root rot

(*Phytophthora lateralis*) ramifications of having dump trucks and a yarder cross the creek and tracked equipment in the creek?

Resolution: The specialist believes that the dump truck, logging truck, yarder and loader crossing the creek during the low flow period would not pose a substantial risk of spreading Phytophthora. His suggestion is that the tracked equipment would be washed to eliminate Phytophthora spread.

Issue 6: Are there any cultural artifacts adjacent to the project reach?

Resolution: The District Archeologist and I.D. Team member conducted a records search and field review of the proposed project site. There are no known cultural resources in the immediate vicinity.

Issue Identified, Analyzed, but Not Used to Develop an Action Alternative

The following issue was identified during the EA process. Analysis of this issues did not suggest different alternatives, nor would it influence the decision. Therefore, it was not discussed further in this EA.

-No boulders utilized within the project design

This issue is excluded from the body of the EA because this provision would constitute the placement of only 38-48 logs and thereby construction of only six of the proposed structures (the other seven structures consist of boulders only). It is therefore unlikely that this limited construction within the proposed restoration reach would constitute an effective project.

SECTION II - ALTERNATIVES INCLUDING THE PROPOSED ACTION

Alternative #1 - No Action

Description

No project would be implemented. This reach of Steel Creek would remain relatively simplified and be of marginal value for salmonid spawning and rearing. Road decommissioning would not occur at this time. Noxious weed treatment and riparian planting would also not occur.

Alternative #2 - Proposed Action

Description

Instream Log and Boulder Placement

The proposed action is to yard 38-48 logs into the 0.3 mile reach of Steel Creek. The logs proposed for use would be obtained from a log stockpile site in South Fork Elk Creek, and would be hauled by log truck to Steel Creek. Log lengths would range from 30-70 feet. Positioning of these logs would be accomplished by an excavator within the stream channel or a yarder situated on the road adjacent to Steel creek; cable and blocks would allow precise placement. Proposed structure sites 2 through 5 consist of a total of 9 logs. An excavator would be employed to carry and place the 9 logs planned. Sites number 6-13 would utilize the yarder and excavator for boulder and log placement. There is a log jam at structure 6 blocking contiguous excavator access within the stream. The log jam should not be disturbed or traversed by the excavator. Instead, the excavator would be traversing the riparian area from the adjacent road on a flagged route (100 ft.) to access the creek. Above the log jam, the excavator would place the boulders and the yarder would be utilized for the placement of the logs. Log and rock trucks would cross Steel Creek and use the adjacent road for the closest access to the structure sites. The maximum distance of travel on the road for the rock and log trucks is 1,100 feet. Only five trips (ten stream crossings) should be required for the log truck. However, due to the amount and size of the boulders required for this project, there would be approximately 30 stream crossings made by the rock truck.

Approximately 140 boulders would be utilized to build five weirs, augment LWD structures, construct two boulder fields and multiple boulder clusters and to ballast the logs within some of the structures. No cable or epoxy anchoring techniques will be utilized. Most boulders should be approximately one cubic yard**.** Some excavating would occur in order to place the boulders flush with floodplain deposition (structure sites #3 & #5). Some excavating will also occur to trench and bury ends of logs to secure structures (structure sites #2 and #8). The excavator would make one pass down to the stream above the log jam. The boulders would be delivered by a rubber-tired loader to the nearest point to the stream and within reach of the excavator. The delivery by the loader would require one flagged access route through the riparian area to the stream (less than 250 feet). No boulders are required for the two uppermost structures, therefore, the excavator will not be necessary above structure site #11. Boulders may also be yarded to the stream and/or into place within the channel by the yarder situated on the 28-11-1.0 road.

To cross the stream, an Armored Vehicle-Launched Bridge (AVLB), other method of bridge placement, low-water crossing or culvert placement would be utilized. The AVLB vehicle is designed to launch and retrieve a bridge; it consists of a portable folding or scissor-type bridge that is transported on the top of a tank chassis. The AVLB may be taken off of its trailer and placed near the site where the vehicle would be stationed to launch the bridge. It is likely that the impacts would be the same as from a crane-placed bridge.

In the event that the bridge is unavailable, a temporary culvert could be placed in Steel Creek to cross the stream. The screened river rock, filter fabric and geotextile that would be placed over the culvert can be removed without substantial turbidity. Alternatively, the equipment could be driven directly over the bedrock substrate. During low flow, the main wetted channel is recessed within a fissure in the

bedrock substrate. This method would require additional grading of both streambanks relative to the AVLB.

Road Decommissioning

The decommissioning of the 28-11-1.0 road would require the removal of two culverts within the first 1,300 feet of the road, using a tracked excavator. A third culvert would require hand excavation of a trench (approx. 1.5 feet deep) over the existing culvert which would channel water if the culvert should become plugged.

Riparian Reserve: Noxious Weed Removal and Replanting

The last phase of the project would consist of removal of approximately .10 acres (4,400 ft.^{2})of blackberry vines and other noxious weeds with the excavator. The area treated would be adjacent to the stream crossing area: approximately 1,300 ft.^{2} would be treated on the left bank (upstream view) and 3,100 ft.^{2} would be treated on the right bank between structure site #1 and structure site #2. The invasive species would be removed with the excavator, followed by planting of hardwoods and conifers.

Alternative #3: No equipment within the stream channel, use of yarder only

Description

The placement of the logs and the boulders would be accomplished by use only of the yarder stationed on the adjacent road. The boulders would be mobilized by use of a chain rock cradle attached to the cable.

The yarder would still have to cross the stream, as would the log and rock trucks. Therefore, equipment capable of shaping the banks would still be necessary for whatever stream crossing method was chosen. The equipment would have to remain on site to restructure the banks at the completion of the project.

Design Features and Conservation Practices

- ! Riparian project instream work and road decommissioning would be scheduled to avoid disturbances to special status species (marbled murrelet and northern spotted owl).

- **!** The timing of in-stream work would comply with the timing restrictions established by the Oregon Department of Fish and Wildlife: July 1 - September 15.

- ! As much as feasible, equipment travel within stream channels would be restricted to

shallow and bedrock areas where the likelihood of injuring or killing aquatic organisms is low.

! Equipment working in and adjacent to stream channels would be prepared to contain accidental fuel or oil spills (hazardous materials) with approved methods and materials, in conjunction with the District Spill Plan and State of Oregon Administrative Rules governing spills and releases.

! Drag routes to access structure sites would be as few as logistically possible, would be direct and not require the removal of any trees larger than 5"dbh.

! The access route for the excavator and loader would be kept to the absolute minimum.

! Monitoring measures would be implemented to document compliance with applicable Best Management Practices (BMPs).

! Project would be implemented in dry weather in order to minimize turbidity.

! Decommissioning of the 28-11-1.0 road would include the removal of two culverts and the return to pre-road hydrologic condition, and hand digging of a channel at a third culvert site**.**

! Should the mobile bridge option be employed, the initiation and placement of the mobile bridge would result in as little disturbance to streambanks as possible.

! If a low-water stream crossing is utilized, the chosen stream site would result in the least possible impact to the streambed and banks.

! If a stream crossing culvert is employed, removal of any gravel, geotextile and the culvert would be conducted in such a manner as to minimize turbidity.

! Streambank modifications to facilitate stream crossing shall be conducted in dry weather conditions, provide for downstream filtering, and banks should be re-fashioned and bioengineering (re-vegetation) techniques employed at the completion of the project.

! Provide for downstream filtering of sediment below the stream crossing area to confine the sediment to the immediate vicinity of the project.

! Culvert removal design features would include the routing of any water around the excavation site. The water would be dispensed into the creek with low volume and

under low pressure or with a velocity barrier in place. The streambed would be disturbed as little as possible.

! Upon completion of instream work, determine Assess sediment delivery potential from loader route to sites 7-13; fracture upper soil horizons on the loader route to initiate sediment infiltration and alleviate soil compaction.

SECTION III - AFFECTED ENVIRONMENT

This section describes the baseline environmental components that could be affected by the Proposed Action, if implemented. This section does not address the environmental effects or consequences, but rather serves as the baseline for the comparisons in Chapter IV - Environmental Consequences.

Location

Located in the Southern Oregon Coastal area, Steel Creek (T28S., R11W., Sec.1) is a tributary to the East Fork Coquille River. The treatment area begins approximately 1.4 miles upstream from the confluence with the East Fork Coquille River. The proposed treatment reach is about 0.3 miles in length.

Stream Channels, Flood Plains, Water Quality & Aquatic Resource

Channel Type

Steel Creek is a fourth-order stream system. The lowest 1.4 stream miles are classified as a Rosgen 'B1/F1' stream type with small amounts of 'C1'. The channel materials are currently dominated by bedrock and by bed features that produce extensive riffles, with infrequent scour holes for pools. "The sequence of the pool-to-pool spacing is irregular and infrequent due to the nature of the bedrock bed" (Rosgen, 1996). The 'B' type channels are generally the mid-order, moderate-relief reaches characterized by gradients of 2-4%. However, this reach is more entrenched than a normal 'B' type stream and therefore, sections of the reach have characteristics more analogous to an 'F' type channel. In August, 2000, a tree-lining and cull-log placement project was completed in which approximately 100 pieces of wood were added to roughly 0.6 miles of stream channel directly below this proposed treatment reach.

From stream mile 1.4 to the head of the proposed reach (at stream mile 1.7) Steel Creek is a G1/B1 Rosgen type. This type of stream is associated with moderately steep, structurally controlled, narrow valleys. "G1 stream channels are deeply entrenched into bedrock and have moderate channel gradients, low width/depth ratios, and randomly spaced steps and plunge pools" (Rosgen, 1996). The majority of this reach has limited rates of lateral or vertical adjustment comparable to a G1 stream channel, however, there are small sections that have characteristics of a B1 such as moderate width/depth ratios and greater lateral extension.

Past Management Activities and Results

Past activities such as splash damming, stream cleaning, road building and timber harvest have altered channel complexity and type. Removal of large wood has greatly affected the proposed project area and the reach below. It has reduced the habitat diversity, decreased bank stability, increased fine sediments, decreased nutrient retention and productivity, increased flow velocity and resulted in a channel that has scoured down to bedrock in many places.

Aquatic Species and Habitat

Stream surveys have been conducted on the majority of Steel Creek by the Oregon Department of Fish and Wildlife. The proposed restoration reach comprises about half of the evaluated reach #2 within the 1997 ODFW survey; this reach includes a section of lower Steel Creek that has a differing valley form and stream morphology with lower gradient and some connectivity to the floodplain than the proposed restoration reach. Therefore, the total reach was found to be rated 'fair' in complex pools, width-to-depth ratios, percent gravel within riffles, and LWD by volume and number of pieces.

Steel Creek is inhabited by winter steelhead, coho salmon, sea-run and resident cutthroat trout. No data is available from which to assess the population status of other fishes (Cyprinids, Cottids, lamprey) within Steel Creek. There is a partial barrier to coho at the top of the proposed treatment reach; the high-gradient cascade approximately 6.5 feet in length defines the end of the reach and poses a partial velocity barrier to coho but not steelhead.

As evidenced by stereographic aerial photographs dated 1950, the Steel Creek stream channel was not incised appreciably at that time. In the aerial photographs of 1970, however, a timber harvest unit had been clearcut directly upstream of the proposed reach with little or no buffering on the tributaries and minimal buffering along Steel Creek. The riparian area in that location had consisted of a large hardwoods/conifer mix. The Steel Creek channel appears to be considerably more incised in these photos than in the 1950 photos. Due to the shading of the stream, it is difficult to ascertain from the photographs how much wood was present in Steel Creek in 1950 and in 1970. The channel incision can be seen from occasional slumps adjacent to Steel Creek. Natural recovery processes are threatened because critical components are missing (i.e. potential for recruitment of large wood, floodplain connectivity, thermal refugia, winter refugia). As indicated by survey data, aquatic habitat enhancement projects (examples such as LWD structures on Weekly Creek and the boulder weirs on Elk Creek) have resulted in appreciable increases in pool habitat quality; the goal for the proposed reach of Steel Creek is to not only increase pool habitat quality and complexity but to accumulate spawning gravels.

Fisheries and Special Status Fish

The following list summarizes the special status fish species known to occur within the Steel Creek drainage:

- ♦ Oregon Coast coho salmon ESU, which encompasses the range of this species north of Cape Blanco, were listed as a Threatened species by the National Marine Fisheries Service in August, 1998.
- ♦ Oregon Coast steelhead ESU was designated as a Candidate species by the National Marine Fisheries Service in March, 1998.
- ♦ Oregon Coast cutthroat trout ESU was designated as a Candidate species by the National Marine Fisheries Service in April, 1999.

Hydrology

The drainage area for the proposed project reach of Steel Creek is 2,104 acres, or 3.29mi^2. The bankfull discharge for Steel Creek is estimated at 160 cfs. The average bankfull width is approximately 22 feet and the average bankfull depth is estimated at 2.0 feet. Summer low flow is approximately 0.5-0.25 cfs for the July 15-September 15 instream-operating period.

Presently, this stream is functioning at risk, that is, it is functioning in a limited capacity but an existing soil, water or vegetation attribute makes them susceptible to further degradation. The trend is away from the site potential and site stability. It resembles a long run or rapid in a chute or trapezoidal channel on a moderate slope (2.5%-4%) that is devoid of roughness elements (such as boulder-sized rock and woody debris) necessary to create a step-pool morphology which would dissipate energy. Currently, Steel Creek is an entrenched bedrock gully G1/B1 stream type (Rosgen 1994).

Soil

This project area is located within a Blachly silty clay loam soil type; the soil type adjacent to the project area is formed from colluvium derived from sedimentary rock or basalt. The permeability of the Blachly soil is moderately slow (.2 to .6 inches/hr.), but is deep with rooting depths greater than 60 inches. Runoff is rapid and the hazard of water erosion is high. Storage of water is moderate at 7.0 to 8.5 inches of available water capacity. Limitations to use are the susceptibility of the surface layer to compaction, steepness of slope, the hazard of erosion and plant competition.

Vegetation

Noxious Weeds

Noxious weed populations are moderate on the project site and consist of Himalayan blackberry (*R. Fruticosus, R. procerus*), which is the dominate species on the project site, and light to heavy populations of broom species (*C. scoparius, C. monspessulanus*) located in the vicinity. Overall site risk condition class is moderate due to the moderately high potential to remove current populations on site. However, due to vigorous recovery of blackberries following disturbance and the potential seed bank, this project site is not considered to be within a high priority area for noxious weed prevention.

Port Orford Cedar and Phytophthora

I.D. Team member and a TSI Forester surveyed the project area for Port Orford Cedar presence. None was found. "The Proposed Action and its Alternative would have no direct, indirect, or cumulative effect on the viability of Port Orford cedar as a species".

Botanical

Surveys were completed during the designated identification period for all species requiring pre-ground disturbance surveys. Steel Creek was surveyed and the riparian habitat searched for vascular plants, bryophytes, and lichens. No Survey and Manage species and no Special Status plants were found in or along Steel Creek. A checklist of species located within the Steel Creek project area is attached to the analysis file.

Wildlife

The proposed project lies entirely within an occupied marbled murrelet site (MONO C3047). There are no known spotted owl centers within 0.25 miles of the project area and no known bald eagles nests within several miles of the project area.

Surveys were conducted for Survey and Manage species. The mollusc species surveyed for are: the Oregon Megomphix (*Megomphix hemphilli*), the blue-grey tail-dropper (*Prophysaon coeruleum*) and the papilose tail-dropper (*Prophysaon dubium*). None of these species were located in the proposed project area. A few Red Tree Vole nests were identified within the project area. The nearest known location for a Del Norte Salamander is approximately 21 miles to the south (the most northerly sighting recorded). Habitat for Del Norte Salamanders within the project area is minimal and marginal, therefore, it is unlikely that Del Norte Salamanders exist within the project area.

Cultural Resources

The lack of known cultural resources, and negative results of field survey indicate intact cultural resources would not be affected by this project.

Hazardous Materials

A Hazardous Materials Level I Site Survey was completed for the project area in December, 2000. There are no known hazardous materials within the project area.

SECTION IV - ENVIRONMENTAL CONSEQUENCES

Critical Element Evaluation of Each Alternative

This section describes the scientific and analytical basis for the comparison of the alternatives, and the probable consequences as they relate to the alternatives. The environmental consequences to critical elements of the human environment (Table 1) were considered within each alternative.

Table 1: Environmental consequences to the critical elements of the human environment

Critical Element of the Human Environment	Present in the Project Area	Affected by No Action (Alternative 1)	Affected by the Proposed Action (Alternative 2)	Affected by Alternative 3
Air Quality	Yes	No	No	No
Cultural Resources	No	N/A	N/A	N/A
Farm Lands	No	N/A	N/A	N/A
Flood Plain	Yes	Yes	Yes	Yes
Native American Religious Concerns	No	N/A	N/A	N/A
Noxious Weeds	Yes	Yes	Yes	Yes
Port Orford Cedar root rot	N/A	N/A	N/A	N/A
Riparian Reserves	Yes	Yes	Yes	Yes
Survey & Manage Species	Yes	N/A	N/A	N/A
T & E Species (Botanical)	No	N/A	N/A	N/A
T & E Species Fisheries (Coho)	Yes	No	Yes	Yes
T & E Wildlife Species (Marbled Murrelet)	Yes	No	No	No
T & E Wildlife Species (Spotted Owl)	No	N/A	N/A	N/A
Wastes: Solid or Hazardous	No	N/A	N/A	N/A
Water Quality	Yes	No	Yes: short term	Yes: short term

Wetlands	No	N/A	N/A	N/A
Wild & Scenic Rivers	No	N/A	N/A	N/A
Wilderness	No	N/A	N/A	N/A

Evaluation of Consistency with East Fork Coquille Watershed Analysis - Alternative #2 and #3

Watershed analysis has a critical role in providing for aquatic and riparian habitat protection by consideration of the state of the channel and riparian area, "condition of the uplands, distribution and type of seral classes of vegetation, land use history, effects of previous natural and land-use related disturbances, and distribution and abundance of species and populations throughout the watershed" (ROD, B-20). The information from watershed analyses contributes to decision-making: priorities for funding, implementation of projects, and development of monitoring strategies and objectives.

The East Fork Coquille Watershed Analysis (BLM, 2000), states that anecdotal accounts and photographic evidence concludes that historically "large wood was very abundant in streams" and that "beaver were abundant at the turn of the century", therefore, the habitat conditions associated with beaver (channel complexity, large complex pools, etc.) probably were common. Extrapolation based on aquatic inventory information suggest that extensive harvest of riparian vegetation, splash dams, and extensive riparian road networks are the primary effects on human activities on the aquatic and riparian systems. The Analysis also states that "excellent opportunities and good access for instream placement of LWD exist on BLM-managed lands" in the proposed reach of Steel Creek. Such projects would address "LWD and/or Pool Complexity deficiencies" and provide enriched habitat for both anadromous and resident fish. In addition, the placement of material in the channel that would allow aggradation and eventual connection to the floodplain may encourage beaver and thus provide habitat complexity and diversity for aquatic life.

Evaluation of Consistency with Northwest Forest Plan Standards and Guidelines

In the Record of Decision (ROD), the main purpose for the allocation of Riparian Reserves "is to protect the health of the aquatic system and its dependent species". Incorporated within this stream restoration project is the removal of the invasive species, blackberry, and the planting of hardwoods and conifers.

The project would comply with the Standards and Guidelines of the ROD for the Northwest Forest Plan for Fish and Wildlife Management and Watershed and Habitat Restoration. The design and implementation of the restoration project would be in accordance with the (WR-1) guidance that

directs projects to be executed. “in a manner that promotes long-term ecological integrity of ecosystems, conserves the genetic integrity of native species and attains Aquatic Conservation Strategy objectives”. The restoration activities would be in accordance with the (FW-1) guidance that directs the design and implementation “in a manner that contributes to attainment of Aquatic Conservation Strategy objectives”. As discussed in ‘Consistency with the Aquatic Conservation Strategy’ (below), it was determined that the Proposed Action (#2) and Alternative #3 would not retard or prevent attainment of ACS objectives.
The closing of the 1.0 road would be based on the “potential effects to the Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs”(RF-3c). The application of silvicultural practices for Riparian Reserves would be in accordance with (TM-1c), “to acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives”.

Evaluation of Consistency with the Aquatic Conservation Strategy - Proposed Action (#2)

“Complying with the Aquatic Conservation Strategy objectives means that an agency must manage the riparian-dependent resources to maintain the existing condition or implement actions to restore conditions” (Record of Decision, Basis for Standards and Guidelines, pp.B-10, 1994). This project would restore channel conditions by the addition of wood and boulders which would aggrade the channel, provide spawning habitat, and reconnect the channel with the floodplain, as it existed prior to splash damming and large wood removal from the channel. Under the Aquatic Conservation Strategy, Riparian Reserves “confer benefits to riparian-dependent and associated species other than fish, enhance habitat conservation for organisms that are dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for many terrestrial animals and plants, and provide for greater connectivity of the watershed” (ROD, pp. B-13). Removal of invasive blackberry and the planting of myrtle, big leaf maple, Douglas fir, and red cedar would enrich the existing Riparian Reserve and improve the connectivity of the watershed and transition zone between the upslope and riparian area**,** thereby benefitting numerous species.

Actions proposed for Riparian Reserves should restore the desired condition/ecological function of the site. Activities such as road decommissioning, riparian silviculture and in-stream projects may affect attainment of ACS objectives in the short term (i.e. by increasing sedimentation of by removing riparian vegetation). However, these actions actually assist in the attainment of ACS objectives in the long term.

There are four components of the Aquatic Conservation Strategy: Riparian Reserves, Key Watersheds, Watershed Analysis and Watershed Restoration (ROD, page B-12). The Proposed Action meets these four components by:

- Removing invasive noxious weeds within the Riparian Reserve and planting with conifers for future woody debris recruitment potential and to provide shade.
- ACS for Watershed Restoration states that “silvicultural treatments may be used to restore large conifers in Riparian Reserves”.

- Steel Creek is not within a Key Watershed. There are no key watersheds within the East Fork Coquille (relevant 5th field watershed).
- The relevant watershed analysis is the East Fork Coquille Watershed Analysis (BLM, 2000).
- Watershed restoration in the Steel Creek drainage is recommended in the East Fork Watershed Analysis
- Restoration of in-stream habitat complexity is identified in the ACS as one of the most important components of a watershed restoration program
- "Watershed restoration should focus on removing and upgrading roads" (p. B-32)

The relationships among the nine Aquatic Conservation Strategy (ACS) objectives, the measurable factors/indicators developed by National Marine Fisheries Service, and site-specific impacts of the Proposed Action are in Appendix A.

Consistency with the Aquatic Conservation Strategy - Alternative #1 (No Action)

The 'No Action' alternative would hinder attainment of Aquatic Conservation Strategy objectives. The objectives give direction to "maintain and restore". If no action is taken with regard to this proposed project, then the existing condition may further degrade. The channel has incised to bedrock, and exhibits primarily riffle habitat. There is currently very little wood in the stream and very little potential for large wood recruitment. Therefore, there is very little possibility that this reach could accumulate gravel and obtain ACS objectives 2,3,5,7,8, and 9, and diversify habitat in the foreseeable future without some assistance.

The 'No Action' alternative would also result in delayed riparian recovery. Noxious weeds that exist at the stream crossing site would not be removed and natural regeneration of plant association components that occur in the adjacent stand (Douglas fir, myrtle, Big Leaf maple, Western Red cedar) would continue to be delayed and sparse or not occur at all. Lack of regeneration would result in deficiency of future coarse wood and also in inadequate vegetation in the riparian for shade and nutrient cycling at this location. This would impede the attainment of ACS objectives 1, 4, 8 and 9.

Road density within the watershed would not decline if the 'No Action' alternative were to be implemented, and therefore could hinder attainment of ACS objectives 1, 4 and 5. Culverts that could become plugged in the future and deliver sediment to Steel Creek would remain. This could prevent attainment of ACS objectives 5 and 6.

Consistency with the Aquatic Conservation Strategy - Alternative #2 (Proposed Action)

Conclusions

The proposed project (Alternative 2) was determined to be consistent with Watershed Analysis recommendations and findings, applicable Northwest Forest Plan Standards and Guidelines, and applicable aspects of NMFS' March 18, 1997 Biological Opinion. In addition, the proposed project would not hinder or prevent attainment of Aquatic Conservation Strategy objectives at the 5th field watershed scale over the long-term.

Consistency with the Aquatic Conservation Strategy - Alternative 3

This alternative design, which consists of no equipment within the stream channel and only the use of a yarder with which to build the structures, would also be less effective in attainment of Aquatic Conservation Strategy objectives. Alternative 3 would not satisfy the objectives as favorably as the Proposed Action. Specifically, ACS objective number 5 is to maintain and restore the sediment regime; the boulders could not be placed as precisely to create structures that would trap/store gravel, therefore, this alternative could impede attainment of ACS objective number 5.

NO ACTION

Fisheries Habitat, Including T & E Species - Issue 1

Direct and Indirect Effects

Under the 'No Action' alternative (Alternative 1), the proposed reach of Steel Creek would persist in its lack of spawning habitat for OC coho and OC steelhead. Fish currently spawn in the reach, but superimposition of redds occur due to lack of gravel. The reach would continue to have mostly bedrock substrate, and the water in the channel would be fast and contain mostly riffle habitat units. The stream channel would remain incised. This situation is likely to persist for several decades, until sufficient levels of naturally-recruited large wood are able to provide the needed roughness to elicit substantial habitat improvements.

Indirectly, substrate moving through the channel would not have a chance to collect due to lack of roughness elements to slow the water and cause gravels to settle out. Without aggradation, it is not likely to contact its flood plain in high flows or provide off-channel habitat in the foreseeable future.

It is unknown if the 28-11-1.0 road would get decommissioned if not combined within this proposed project. The planting of the banks near the stream crossing would likely not occur. The blackberry species that has invaded is not under a canopy, therefore, the blackberry would not become shaded by competing tree species within the near future (ten years). The blackberry have grown thick, making competition from other naturally generated species unlikely.

Cumulative Effects

The stream channel would likely remain in its current condition: bedrock substrate, minimal spawning gravel, and very little habitat diversity or complexity. It is possible that one or more culverts on the adjacent road would plug during a high flow event, channeling the water down the road. This could result in substantial sediment delivery to Steel Creek with a storm event of this nature. It is likely that coho and/or steelhead spawning would coincide. The delivery of sediment into Steel Creek at that time could result in not only the demise of adult fish but also cause suffocation of eggs within redds.

No removal of invasive blackberries from banks would hinder future potential large wood recruitment. In addition, there is little shade currently in that particular area. That area of Steel Creek has provided resting pools for spawning salmon, steelhead and large schools of searun cutthroat trout; it has also provided habitat for beaver. If the banks were cleared of blackberries and replanted, it would also allow more typical riparian species, such as Red Alder, to thrive.

Hydrology/Water Quality - Issues 2 and 4

Direct and Indirect Effects

In the short term, the proposed project reach of Steel Creek would continue to be a high energy stream during moderate or greater flow events. Fine and coarse sediments, including gravels, would continue to be routed quickly through the stream reach due to lack of structure to dissipate the flow, slow the velocity, and hence support deposition. The stream reach would continue to resemble a long, sloping ditch and be riffle/run dominated.

Cumulative Effects

Recruitment of LWD into Steel Creek from adjacent forest stands may still be expected in the long term. Base level would not degrade further because it is on bedrock. Total width within the entrenched channel should increase slowly with time as the stream attempts to create a limited floodplain.

Wildlife, Including T & E Species and Survey and Manage Species- Issue 3

Direct and Indirect Effects

Under the 'No Action' alternative, there would be little effect on the wildlife species with regard to the stream restoration project or the road decommissioning. However, the blackberry on the bank adjacent to the stream crossing provides less wildlife habitat than would the establishment of native conifer species and the ecosystem associated with it.

The Survey and Manage species would not benefit from the 'No Action' alternative. The road decommissioning and the removal of the invasive blackberries and the planting of that area would not occur and therefore, additional habitat that would benefit Survey and Manage species would not be provided. There would be little effect to Survey and Manage species with regards to the stream restoration project.

Cumulative Effects

The cumulative effects on wildlife from this 'no action' alternative would be the lack of long-term benefit from the removal of the blackberry near the proposed stream crossing. There would be slightly less browse for ungulates and in the long-term, there would be no re-establishment of hardwoods, conifers and associated plants for future habitat. There would also be no benefit obtained from the decommissioning of the adjacent road. There would be negligible cumulative effects to wildlife from the lack of the in-stream project work.

Soils - Issue 4

Direct and Indirect Effects

The level of turbidity of the water would be unaffected during the low flow season. Gravel would continue to be removed from the system. The bedrock channel would continue to lack roughness and therefore be unable to capture incoming wood and debris.

Failure to decommission the 28-11-1.0 road would mean no culvert removal. Therefore, a high risk of the first culvert to clog and divert down the road continues.

Noxious Weeds

Direct, Indirect and Cumulative Effects

Current noxious weed populations on the project site would continue to increase if left untreated.

PROPOSED ACTION - STREAM RESTORATION, ROAD DECOMMISSIONING AND PLANTING

Fisheries Habitat, Including T & E Species - Issue 1

Direct and Indirect Effects

The proposed action necessitates equipment in the stream channel for placement of boulder weirs. The present substrate within this reach is mostly bedrock and therefore minimal impact and turbidity is expected from excavator movement within the stream channel. Best Management Practices would be employed to stay within DEQ standards; this may include temporary filter dams or water bypass structures to minimize turbidity downstream from the project area.

Ground disturbance from the front-end loader route to the upper structure sites would be approximately 100 feet in length from the 1.0 road in the stream, resulting in an approximately 10-foot wide swath. The total area disturbed would be approximately 1,000 $ft.^2$ There are a few sapling or smaller sized alder and vine maple on this route that would be removed for access. The loader would make approximately 25 passes from the area where the boulders are staged to the end of the access route. The distance from the 1.0 road to stream access for the excavator is approximately 200 feet

long, which would create a swath approximately 10-feet wide. Therefore, ground disturbance resulting from the excavator amounts to approximately 2,000 ft.^{2}. However, the excavator will be making only one pass down to the stream and one pass back up. Only a few vine maple and small alder will be removed to accommodate passage. There will be no conifers damaged or removed on either of these routes. Ground disturbance from log drag routes likely would be minimal as block and tackle permits lift on the log. Ground disturbance is usually shallow and revegetates in the spring. Staging areas on the 1.0 road for the rock and logs will utilize wide portions of the 1.0 road that lend themselves to rock and log deck sites. No impacts are expected at these sites.

Some short-term turbidity would be expected from the road decommissioning action, i.e. culvert removal. Flows within the perennial stream would be routed around the work area and back into its channel to prevent excessive turbidity from entering Steel Creek while removal is occurring. The resulting trench would be restored to pre-road hydrologic condition. There is a second culvert on an ephemeral stream that would be trenched above should the culvert become clogged. Any water would thus flow into the trench and back into the channel below the culvert. Trenching would occur by the use of hand tools, and therefore very minimal impact would be expected.

Using the AVLB to cross the stream is the lowest impact option. The AVLB would be taken off of its trailer and placed on the precise site where the vehicle would be stationed to launch the bridge. Thus, the tank chassis would only require minimal movement and the tracks on the chassis would not cause impacts to the site. In addition, a lesser amount of refashioning of the stream banks and/or terrace would be required in the placement of a bridge. It is estimated that no more than 800 ft.^{2} of ground would be disturbed as a result of bridge placement and berm removal. This disturbed soil would be seeded and mulched to prevent erosion. Elimination of the two berms and the shaping of a small portion of the 1.0 road would have to occur with any chosen method of stream crossing in order to facilitate vehicle use. This would affect approximately 200 ft.^{2} of ground adjacent to Steel Creek.

Removal of approximately .10 acres of blackberry may result in short-term sedimentation. Removal of blackberries would be accomplished with the use of the excavator, therefore, some soil disturbance would be expected.

Many direct and indirect benefits are expected to result from this project. The addition of large wood and boulders where this channel lacks roughness would facilitate accumulation of gravel for spawning of coho, steelhead and cutthroat trout. The structures would result in an increase in complex pool habitat. Indirectly, the structures would serve to accumulate additional debris drifting downstream. This occurrence would result in additional aggradation and eventually help reconnect the stream to the floodplain.

The proposed project would provide a basis for the beginning of substrate collection. With the addition of roughness (i.e. large wood and boulders), the project can initiate aggradation. The wood and boulders provide roughness by which other debris drifting from upstream can collect.

Cumulative Effects

The additive effects of the in-stream structures, road decommissioning and removal of the invasive species on the banks would be to create improved habitat for aquatic species. The structures would accumulate debris and gravel for spawning. They would create complexity within the habitat by increasing the quantity of pools and the quality of those pools by adding scour and cover elements. This type of channel would be expected to have a step-pool morphology, partially due to its 3% gradient and geology. This type of morphology can occur only by the addition of structure to the stream which would aggrade on the upstream and scour on the downstream side.

The planting of the banks would provide shade and future large wood recruitment to the stream. The decommissioning of the 28-11-1.0 road would consist of the removal of two culverts and thereby eliminate the risk of debris plugging the culvert and flow diversion down the road. The removal of the culverts would eliminate a potential sediment source.

Hydrology/Water Quality - Issues 2 and 4

Direct and Indirect Effects

The project reach would benefit from LWD and boulders which would provide resistance to flow. An excavator would be utilized within the channel to locate logs and place boulder-sized rock. An access path to the stream approximately mid-reach would be required ; this path may cause some soil delivery to Steel Creek, however, the DEQ's turbidity standard is expected to be met with planned designed features. Since the stream is bedrock, the excavator would have little to no effect on water quality from working within the channel. Furthermore, flow would be very low during the work period, and filter dams or water bypass can be accomplished, as necessary.

A temporary army Armored Vehicle-Launched Bridge may be used to cross Steel Creek to reach the 28-11-1.0 road at the start of the project reach. A bridge would essentially have no impact. Some modification to the banks may be required to properly align the bridge, but sediment delivery to the stream would likely be avoided because earthwork for the soil platform where the AVLB would be stationed to deploy the bridge is set back vertically and laterally from the stream channel. Design features required to meet the DEQ's turbidity standard would be applied, as needed.

A temporary low-water crossing would require bank shaping on the approaches. Traffic over the stream would have little impact since the streambed is on bedrock and the low summer flow would be recessed in slots in the bedrock at the crossing. A minor amount of sediment could be delivered from the approaches if there were a summer rain. If the banks are reshaped and restored at the conclusion of the project using bio-engineering design features, there would be little effect on water quality.

Removal of approximately .10 acres of blackberry vines and other noxious weeds is above the channel margin and would have no effect on water resources.

Cumulative Effects

Based on planned design criteria and location information, this alternative (Alternative 2, Proposed Action) would transform the channel into a step/pool sequencing stream and provide resistance elements that vary the velocity distribution and store fine and coarse sediments.

Two culverts on the adjacent access 28-11-1.0 road would be removed as part of road decommissioning. This would lower hydrologic risk of washout as this road is not currently maintained. A third small culvert on an ephemeral channel would be hand dug to reestablish the natural drainage; this would also result in lowering hydrologic risk.

Wildlife, Including T & E Species and Survey and Manage Species- Issue 3

Direct and Indirect Effects

There would be no potential disturbing activities (i.e. activities that generate noises above ambient) between April 1 - August 5 and daily timing restrictions would be used for potentially disturbing activities between August 6 - September 15.

In accordance with the Draft version 2.0 Survey Protocol for Terrestrial Mollusk Species, two sets of surveys were conducted for three mollusc species: the Oregon Megomphix (*Megophix hemphilli*), the blue-grey tail-dropper (*Prophysaon coeruleum*) and the papilose trail-dropper (*Prophysaon dubium*). None of these species were located in the proposed project area and therefore, there is a low probability of causing direct or indirect impacts to S&M mollusk species. A few Red Tree Vole nests were located but should not be impacted by the project as there would be no disturbance to them or reduction in canopy cover. There is a low likelihood that Del Norte Salamanders exist in the area (the most northerly location is 21 miles to the south) and therefore, there is a low probability of causing direct or indirect impact to Del Norte Salamanders.

The removal of blackberry and the replanting of conifer (Douglas Fir and Western Red Cedar) and hardwoods (Big Leaf Maple and Myrtle) would create a minor short-term impact to some wildlife species, particularly mustelid (mink, weasel and ermine) and rodents (beaver). These species would likely use the blackberry as food and/or cover. Planting of the conifers and hardwoods and the re-establishment of their associated ecosystem, however, may create long-term beneficial results. The diversity of the future stand may provide re-establishment of cavity structure for arboreal mammals such as squirrels and bats. Cavities may also be utilized by birds and herptiles; the re-established stand may also provide Survey and Manage mollusk habitat.

The return of native species such as salmonberry and the demise of this exotic blackberry species within this very localized area would benefit ungulates in the long-term by providing additional browse. There is also plenty of blackberry available in remaining areas to provide shelter and food for small mammals if necessary.

Future maintenance (hand-brushing) around the planted trees would create persistent disturbance which could affect small mammals, some songbirds and ungulates. However, this disturbance can be minimized by scheduling the brushing maintenance in March and August before songbird nesting and after the birds have fledged.

The decommissioning of the 28-11-1.0 road should benefit wildlife and Survey and Manage species by removing culverts that are risk of clogging and potentially resulting in sediment delivery to the watershed, which could affect amphibian and listed mollusk species.

Cumulative Effects

The in-stream restoration project would have slight beneficial effects to wildlife. With a potential increase in available spawning habitat and therefore an increase in fish production, the nutrients from the demise of the spawning fish contributes to the vigor and health of local aquatic species and to the riparian area. The fish also provide food for mammals such as mink and raccoon. Slowing the water may also entice beaver to inhabit and build dams which would, in turn, benefit juvenile salmonids. The brushing and replanting of the bank adjacent to the stream crossing and the decommissioning of the road may provide additional habitat by re-establishing native species that would contribute to a healthier riparian area and eventually provide long-term diversity and complexity of habitat.

Soils - Issue 4

Direct and Indirect Effects

Road Decommissioning

One stream crossing culvert and one ditch relief culvert is proposed for removal within the first 1,300 feet of the 1.0 road. Flows within this perennial stream would be routed around the work area and back into its channel to prevent excessive turbidity from entering Steel Creek. The other culvert is on an ephemeral stream and is located at approximately 25+00; its drainage area is small and has low risk of diversion should it become plugged. A small channel two feet wide and 1 foot deep could be dug into the old road grade directly above the old culvert so that flow may be directed into the stream channel should the pipe plug. The specialist did not see the utility of bringing the excavator 1,300 feet up the mostly grown-over road to remove a culvert that appears to receive only ephemeral flows. Therefore, the trench was proposed to direct any flow into the channel instead of down the road. When the culverts are removed, there would be minimal increased turbidity levels.

Sub-soiling of the 1.0 road grade will not accomplish any functional increase in the infiltration rate over time. Currently, the gravel surface is providing a high rate o infiltration and a layer of protection against erosion. Removal of this surface rock would be required in order to allow equipment to reach the native dirt surface. Planting and successful establishment of trees on this road could be accomplished only with the rock removed, however, the number of trees added to the total riparian reserve would be minimal and would not justify the additional cost of sub-soiling this road.

Stream Crossing

Short and long term turbidity may be the result of bank reconstruction that may occur as a result of bridge placement or the placement the ford materials at the stream crossing. Crossing the creek with the bridge would be the least impact upon the banks and the water quality. Only short-term delivery of sediment would occur as a result of shaping the banks to accommodate landing areas for the ends of the bridge. Some soil may enter the water during this placement and turbidity can be expected to increase above the background level. This increase would not exceed the two hour limit acceptable by DEQ and the Clean Water Act.

Construction of a dry ford would entail the placement of a culvert held in place with washed river rock, geotextile material and a lift of crushed surface aggregate. Placement of the culvert and rock would result in additional sediment to the stream during construction and removal. Only minor turbidity increases are expected from these actions and the pulse nature of this delivery will be interspersed with long recovery periods. Sediment control measures to filter the turbidity would be in place downstream of the crossing area, regardless of which stream crossing method is employed.

Rock and Log Placement

Walking the excavator up and down the stream channel would release fine sediment to the water; some retention of these fines will occur as the water passes over other gravel bars and filtering occurs. It is not expected that the water column would be inundated during the coarse of the work. During the placement of the logs, some scraping of the riparian vegetation and soil from adjacent banks would occur as the log is placed; turbidity levels may increase above background levels at this time. In the past, these types of activities have created turbidity that has not lasted for more than two hours.

To transport the boulders to the stream, the excavator and a front-end loader may be utilized. Moving in and out of the riparian with a loader will create a traffic path of compacted soil between the road and the stream. More than six trips would be necessary, therefore, the potential to expose the mineral soil and displace the vegetation is high. To prevent runoff from occurring on the compacted surface, the upper soil horizons will be fractured on the loader route to initiate sediment infiltration and alleviate soil compaction.

Cumulative Effects

There should be no long-term impacts to water quality during the construction period. High levels of turbidity are experienced within Steel Creek each winter and the routing of fine and coarse sediments are part of the natural process. Aggradation of gravels behind the structures would occur and may allow storage of material that is presently being routed out of the drainage and into the East Fork Coquille River. This material is necessary within the drainage to improve the habitat for fish spawning, rearing and to provide stability to the stream channel.

Port Orford Cedar/Root Rot- Issue 5

There was no Port Orford Cedar located within the project area, therefore, the 'Proposed Action' alternative would have no direct, indirect or cumulative effect on the viability of Port Orford Cedar.

Cultural Resources - Issue 6

There were no cultural resources detected within the project area, therefore, there are no environmental consequences for cultural resources under the 'Proposed Action' alternative.

Vegetation, Including T & E Species and Survey and Manage Species

No Special Status plants or Survey and Manage botanical species were found, therefore, there are no direct/indirect or cumulative effects to these resources.

Noxious Weeds

Direct, Indirect and Cumulative Effects

The project has the potential to increase noxious weed populations. Only a single species is currently present on the project site, however, the project may increase the diversity of noxious weed species which may further degrade the health of the local plant community.

Recommendations for prevention of the spread of noxious weed species are as follows:

- Remove seed source that could be picked up by passing vehicles and limit seed transport into relatively weed-free areas at moderate or high ecological risk
- Retain shade to suppress weeds
- Re-establish vegetation on all bare ground to minimize weed spread
- Minimize weed spread caused by moving infested gravel and fill material to relatively weed-free locations
- Minimize sources of weed seed in areas not yet re-vegetated
- Ensure establishment and maintenance of vigorous, desirable vegetation to discourage weeds
- Minimize roadside sources of weed seed that could be transported to other areas
- Ensure that weed prevention and related resource protection is considered in travel management

Hazardous Materials

No contaminants were located within the project area, therefore, no Level II site survey is recommended. Recommendations are the same for this alternative as for alternative number 3.

DESIGN RECOMMENDATIONS

- Any instream or streamside work involving heavy equipment is subject to State and Federal Law governing petroleum spill prevention and cleanup including: Oregon Administrative Rules (OAR) 340, Division 108, Oil and Hazardous Materials Spills and Releases (DEQ), and OAR 629-57-3600, Petroleum Product Precautions, Oregon Forest Practices, and
- contractors and/or operators should be made aware of the BLM Coos Bay District Spill Plan in effect for riparian operations, and it should be followed in the event of any release of petroleum or hazardous materials.
- A Spill Prevention, Control and Countermeasure Plan (SPCC) and appropriate spill kit is required on site.

Port Orford Cedar/Root Rot- Issue 5

There was no Port Orford Cedar located within the project area, therefore, this Proposed Action would have no direct, indirect or cumulative effect on the viability of Port Orford Cedar.

Cultural Resources - Issue 6

There were no cultural resources detected within the project area, therefore, there are no environmental consequences for cultural resources under this Proposed Action.

Vegetation, Including T & E Species and Survey and Manage Species

No Special Status plants or Survey and Manage botanical species were found, therefore, there are no direct/indirect or cumulative effects to these resources.

Noxious Weeds

Direct, Indirect and Cumulative Effects

The effects and recommendations are the same as the Proposed Action.

Hazardous Materials

No contaminants were located within the project area, therefore, no Level II site survey is recommended. Recommendations are the same for this alternative as for Alternative number 3.

Alternative #3: No equipment within the stream channel, use of yarder only

Fisheries Habitat, Including T & E Species - Issue 1

Direct and Indirect Effects

Use of a yarder for boulder placement is less efficient and effective. The cost of executing this project would probably increase. The boulders would not be placed in an interlocking manner within the proposed structures. The boulders therefore would be more likely to move in high flows. Also, this method of assembling the structures would be slower**.** Boulders could be still used as ballasts in the structures that utilize logs, but any placement of the boulders would not be as precise or as effectual. The possibility that both boulders and logs would move within the channel is greater than in Alternative 2. The excavator would still be utilized to remove the culverts and remove the noxious weeds from the banks. Therefore, the effects of these actions would be the same with this alternative as with alternatives 2 and 3.

Cumulative Effects

If boulders and/or logs moved, it is possible that they could relocate to a less desirable position. These roughness elements are less likely to enhance habitat complexity or to promote the step-pool stream morphology if they move. It is possible that they could relocate in such a manner as to promote undesirable scour.

Hydrology

Direct and Indirect Effects

The effects of this alternative would be similar to Alternative 3. A rock carriage on a cable system would not be very accurate in placement of the rocks.

Cumulative Effects

Log and boulder movement may result in debris jams and a dam break flood as the worst case scenario.

Wildlife

Direct, Indirect and Cumulative

The effects of this alternative would be similar to the Proposed Action.

Soils

Direct and Indirect Effects

The impacts of crossing the stream would remain the same as in the Proposed Action. However, the disturbance of the riparian area and streambanks would be more in this alternative than in the Proposed Action. This disturbance would come from the dragging of the rock over the ground; placement and control of the boulders and logs would be less precise in this alternative. The banks and stream channel may be impacted to a higher degree because the yarding of the structure elements translates to

restricted movements on a cable, as opposed to precise placement using an excavator.

Cumulative

More disturbance would equate to more turbidity during the project time-frame. Additional time would be required to set up and yard the boulders and logs to the stream, therefore, fine sediment delivery may be of a longer duration than in the Proposed Action. Also, boulders placed with a yarder cannot be keyed into the streambed or streambank as effectively as with an excavator and therefore could be subject to movement downstream in peak flows.

There should be no long-term impacts to water quality from the delivery of sediment to the stream during the construction period. Over time, streambanks may become less of a source for sediment recruitment and improve the water quality over the long term.

Essential Fish Habitat

The analysis area contains Designated Critical Habitat which is also "Essential Fish Habitat", as defined in the Magnuson-Stevens Act. Based on this information the action alternatives would have beneficial affects on Designated Critical Habitat, Essential Fish Habitat and Threatened and Endangered species in the long term.

Port Orford Cedar/Root Rot- Issue 5

There was no Port Orford Cedar located within the project area, therefore, Alternative 3 would have no direct, indirect or cumulative effect on the viability of Port Orford Cedar.

Cultural Resources - Issue 6

There were no cultural resources detected within the project area, therefore, there are no environmental consequences for cultural resources under Alternative 3.

Vegetation, Including T & E Species and Survey and Manage Species

No Special Status plants or Survey and Manage botanical species were found, therefore, there are no direct/indirect or cumulative effects to these resources.

Noxious Weeds

Direct, Indirect and Cumulative Effects

The effects and recommendations are the same as the Proposed Action.

Hazardous Materials

No contaminants were located within the project area, therefore, no Level II site survey is recommended. Recommendations are the same for this alternative as for the Proposed Action.

Section V - List of Preparers and Contributors
Literature Cited

List of Preparers and Contributors

Pam Olson	Fisheries Biologist, Team Lead
Dale Stewart	Soil Scientist
Dan Carpenter	Hydrologist
Michael Kellett	Fisheries Biologist
Scott Lightcap	Fisheries Biologist
Jim Heaney	Wildlife Biologist
Andrea Pipp	Botanist
Bob Raper	Noxious Weed Specialist
Stephen Samuels	Archeologist
Tim Votaw	Hazardous Material
Jim Kowalick	Port Orford Cedar Specialist
Joel Robb	Roads Manager

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Appendix A

The summary of Steel Creek restoration design features, impacts of the Proposed Action on aquatic/riparian values within the Southwest Province Tyee Sandstone Physiographic Area, Matrix of Factors and Indicators (Attachment 3 to the NMFS Biological Opinion, March 18, 1997), and assessment of consistency with the ACS objectives.

ACS Objectives Northwest Forest Plan	Factors/Indicators (NMFS)	Steel Creek Restoration Design Features and Impact Analysis
2,4,8,9 Design features would maintain spacial and temporal connectivity within the drainage network with regard to shade and water temperature (ACS#2), maintain water quality with respect to temperature (ACS#4), maintain vegetation for adequate summer/winter thermal regulation for aquatic species (ACS#8), and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).	Water Quality /Temperature	Interim Riparian Reserve (RR) widths would be maintained on all streams within, and adjacent to, the project area; this is of sufficient width to maintain water temperature. The proposed action would provide beneficial effects to water temperature by planting conifer within the Riparian Reserve where there currently are none, thereby reducing solar warming.
4,5,6,8,9 Design features would maintain water quality (ACS#4) in the long term, temporarily degrade turbidity in the short term, but maintain the sediment regime in the long term (ACS#5), maintain instream flows to retain patterns of sediment routing (ACS#6), maintain vegetation to provide adequate rates of erosion and supply coarse woody debris to enhance physical complexity and stability (ACS#8), and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).	Water Quality /Sediment/Turbidity	Interim Riparian Reserve (RR) widths would be maintained on all streams within, and adjacent to, the project area. Elevated stream turbidity is likely during construction (1 week). Turbidity during construction is likely to be above summer background levels. Short-term turbidity would be minimized by Best Management Practices (BMPs). Project is designed to enhance in-channel sediment by the addition of coarse woody debris and boulders and therefore would enhance the long term sediment regime.

ACS Objectives Northwest Forest Plan	Factors/Indicators (NMFS)	Steel Creek Restoration Design Features and Impact Analysis
2,9 These design features would maintain spacial and temporal connectivity within the drainage network (ACS#2) and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).	Habitat Access/ Physical Barriers	The proposed project would not create physical barriers or otherwise degrade access to aquatic habitat. It would enhance lateral, longitudinal, and drainage network connectivity.
4,6,8,9 Design features would maintain water quality with regard to chemical concentration/nutrients (ACS#4), maintain in-stream flows to retain patterns of nutrient, wood and sediment routing (ACS#6), maintain vegetation to provide adequate nutrient filtering and enhance amounts and distributions of coarse woody debris (ACS#8), and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).	Water Quality/ Chemical Concentration/ Nutrients	Interim Riparian Reserve (RR) widths would be maintained on all streams within**,** and adjacent to, the project area; this is sufficient to maintain the natural input of organic material into streams by riparian vegetation. The proposed action involves the use of heavy equipment in immediate proximity to the stream channel. However, water quality would be maintained through implementation of the *Conservation Practices for Streams and Riparian Reserves #13* (Coos Bay District ROD, BMP's p.D-3). Furthermore, the contract would have requirements pertaining to water quality in connection with all construction and handling of hazardous materials to prevent any chemical entry into any surface waters.

ACS Objectives Northwest Forest Plan	Factors/Indicators (NMFS)	Steel Creek Restoration Design Features and Impact Analysis
3,5,6,8,9 Design features would enhance banks and bottom configurations of the aquatic system (ACS#3), temporarily degrade turbidity in the short term, but maintain/enhance the sediment regime in the long term (ACS#5), maintain instream flows to retain patterns of sediment routing (ACS#6), maintain and enhance species composition and structural diversity of plant communities to provide future coarse woody debris for physical complexity and stability (ACS#8), and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).	Habitat Elements/ Sediment	Interim Riparian Reserve (RR) widths would be maintained on the stream within the project area. The RRs are sufficient in all but the immediate stream crossing area to filter any sediments from adjacent slopes, prevent delivery to stream channels, and avoid downstream effects. The project would include the addition of woody debris into the stream channel and the planting of seedlings within the RR at the stream crossing area, therefore, the potential recruitment of large wood from debris torrents, landsliding, and windthrow would be maintained. Also, sediment storage capabilities would be maximized. The project includes the decommissioning of an adjacent road which has two culverts that would be removed. The channels would be restored to pre-road hydrologic conditions to minimize the risk of road-related sediment delivery to the stream.
6,8,9 These design features would maintain instream flows to retain patterns of wood routing(ACS#6), maintain and restore species composition and diversity to supply amounts of coarse woody debris (ACS#8), and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).	Habitat Elements/ Large Woody Debris	Interim Riparian Reserve (RR) widths would be maintained on the stream. Therefore, the potential recruitment of large wood from debris torrents, landsliding and windthrow would be maintained. Planting would occur in the project area where currently few trees exist. Potential recruitment for large woody debris would be enhanced by this project. Large wood would be added to the stream which would assist in the restoration of physical complexity and stability.

ACS Objectives Northwest Forest Plan	Factors/Indicators (NMFS)	Steel Creek Restoration Design Features and Impact Analysis
2,3,5,8,9 These design features would enhance connectivity with the floodplain and intact refugia (ACS#2), maintain and restore the physical integrity of the banks and bottom configuration (ACS#3), enhance the sediment regime by improving storage capabilities (ACS#5), maintain and restore the species composition and structural diversity of plant communities in riparian areas to supply coarse woody debris (ACS#8), and therefore would maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species (ACS#9).	Habitat Elements/ Pool Area (%)	The project design would add wood and boulders to the stream channel to accumulate gravel and aggrade, thereby restoring stream dynamics, floodplain association, and enhancing the bottom configuration of the stream. Planting would occur in the Riparian Reserve which would become a potential source of large wood. The addition of wood and boulders to the channel would create step-pool features that would enhance pool area.
2,3,5,9 The design features would maintain and restore connectivity (ACS#2), maintain and restore the physical integrity of the aquatic system (ACS#3), enhance the sediment regime by influencing sediment storage (ACS#5), and thereby maintain and restore habitat to support well-distributed riparian-dependent-populations (ACS#9).	Habitat Elements/ Pool Quality	The project would enhance sediment storage and also facilitate scour to improve the quality of pools. The stream channel level would raise, providing connectivity to the floodplain which would contribute to moderation of the flow regime. The addition of wood and boulders to the channel would create step-pool features that would enhance pool quality.

ACS Objectives Northwest Forest Plan	Factors/Indicators (NMFS)	Steel Creek Restoration Design Features and Impact Analysis
1,2,3,7,8,9 The design features would maintain the distribution, diversity, and complexity of watershed and landscape-scale features (ACS#1), maintain and restore connection to the floodplain (ACS#2), maintain and restore the banks and bottom configurations (ACS#3), maintain and restore the timing, variability, and duration of floodplain inundation (ACS#7), maintain and restore vegetation for appropriate erosion rates, channel migration and amounts of coarse wood (ACS#8) and thereby maintain and restore habitat to support well-distributed riparian-dependent populations (ACS#9).	Habitat Elements/ Off Channel Habitat	The project would enhance the complexity of the aquatic habitats and contribute to the re-establishment of the connection to the floodplain by the addition of in-stream structures. The structure would accumulate gravels that would contribute to the restoration of the bottom configuration. The timing and duration of floodplain inundation would be moderated (by the re-connection to the floodplain). This would also create off-channel and backwater habitat. Interim Riparian Reserve (RR) widths would not be altered but rather the RR would be enhanced by the planting of trees in a disturbed site where no trees are currently. This would contribute to future large wood recruitment.
1,2,3,5,8,9 The design features would maintain the distribution, diversity, and complexity of watershed and landscape-scale features (ACS#1), maintain and restore connection to the floodplain (ACS#2), maintain and restore the banks and bottom configurations (ACS#3), enhance the sediment regime by influencing sediment storage (ACS#5), maintain and restore vegetation for appropriate erosion rates, channel migration and amounts of coarse wood (ACS#8) and thereby maintain and restore habitat to support well-distributed riparian-dependent populations. (ACS#9).	Channel Condition & Dynamics/ Width/Depth Ratio	The majority of the project is within a incised bedrock channel and therefore would not alter width or channel migration for many years. Eventually, it could aggrade the channel sufficiently to re-connect it to its floodplain and hence allow for channel migration and appropriate width/depth ratios. However, the addition of wood and boulders accentuates a step-pool morphology and thereby increases the frequency and depth of the pools within the treatment reach. The planting within the RR would promote an intact riparian community capable of filtering sediment.

ACS Objectives Northwest Forest Plan	Factors/Indicators (NMFS)	Steel Creek Restoration Design Features and Impact Analysis
3,5,8,9 The design features would maintain and restore the banks and bottom configurations (ACS#3), enhance the sediment regime by influencing sediment storage (ACS#5), maintain and restore vegetation for appropriate erosion rates, channel migration and streambank stability (ACS#8) and thereby maintain and restore habitat to support well-distributed riparian-dependent-populations (ACS#9).	Channel Condition & Dynamics/ Streambank Condition	The majority of the project is within a incised bedrock channel and therefore would not alter the streambank condition for many years. The banks that are currently accessible within the project area would be maintained or enhanced by the implementation of the structures in the channel. These structures would slow the water which could slow the rate of bank erosion. The planting within the RR would enhance bank stability in the treated area.
1,2,3,6,7,8,9 The design features would maintain the distribution, diversity, and complexity of watershed and landscape-scale features (ACS#1), maintain and restore connection to the floodplain (ACS#2), maintain and restore the banks and bottom configurations (ACS#3), maintain and restore in-stream flows for nutrient, sediment and wood routing (ACS#6), maintain and restore the timing, variability, and duration of floodplain inundation (ACS#7), maintain and restore vegetation for nutrient filtering, appropriate erosion rates, channel migration and amounts of coarse wood (ACS#8) and thereby maintain and restore habitat to support well-distributed riparian-dependent populations (ACS#9).	Channel Condition & Dynamics/Floodplain Connectivity	The majority of the project is within a incised bedrock channel and therefore would not alter floodplain connectivity for many years. Eventually, the addition of boulders and large wood would result in channel aggradation sufficient to re-connect it to its floodplain and hence enhance the channel condition and dynamics. The addition of wood and boulders is designed to aggrade the channel, thereby enhancing floodplain connectivity.

ACS Objectives Northwest Forest Plan	Factors/Indicators (NMFS)	Steel Creek Restoration Design Features and Impact Analysis
1,2, 4, 5, The design features would maintain the distribution, diversity, and complexity of watershed and landscape-scale features (ACS#1), maintain water quality (ACS#4) in the long term, temporarily degrade turbidity in the short term, but maintain the sediment regime in the long term (ACS#5)**.**	Watershed Condition/ Road Density & Location	
1,2,5,8,9 The design features would maintain the distribution, diversity, and complexity of watershed and landscape-scale features (ACS#1), enhance connectivity with the floodplain (ACS#2)**,** enhance the sediment regime by improving storage capabilities (ACS#5), maintain and restore the species composition and structural diversity of plant communities in riparian areas (ACS#8), and therefore would maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species (ACS#9).	Watershed Condition/ Disturbance History	The project is within a Riparian Reserve (RR) but would not disturb unstable or potentially unstable areas. It would enhance the complexity of the drainage and thereby enhance the watershed as a whole. It would eventually enhance connectivity with it's floodplain and improve habitat for aquatic refugia. The project includes improving previously disturbed areas, i.e. the decommissioning of the adjacent road and removal of the culverts, and the planting of an area that currently does not have trees.
1,3,5,8 The design features would maintain the distribution, diversity, and complexity of watershed and landscape-scale features (ACS#1), maintain and restore the banks and bottom configurations (ACS#3), enhance the sediment regime by influencing sediment storage (ACS#5), and maintain and restore vegetation for appropriate erosion rates, channel migration (ACS#8).	Watershed Condition/ Landslide and Erosion Rates	Interim Riparian Reserve (RR) widths would be maintained on the stream. The proposed action would occur on stable, low-gradient areas. The project would encourage sediment storage and thereby would be improving the bottom configuration and sediment regime. Planting would be occurring to assist with erosion control in previously disturbed areas.

ACS Objectives Northwest Forest Plan	Factors/Indicators (NMFS)	Steel Creek Restoration Design Features and Impact Analysis
1,2,4,8,9 The design features would maintain the distribution, diversity, and complexity of watershed and landscape-scale features (ACS#1), enhance connectivity with the floodplain and intact refugia (ACS#2)**,** maintain vegetation to provide adequate nutrient filtering and enhance amounts and distributions of coarse woody debris (ACS#8), and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).	Watershed Condition/ Riparian Reserves	Interim Riparian Reserve (RR) widths would be maintained on the stream. The RR system would maintain shade, large wood recruitment, habitat protection and connectivity in the analysis area. The proposed actions would not involve the removal of trees from the riparian area. Seedlings would be planted in the area of the stream crossing within the project area.